ANALYSIS OF THE INDUSTRIAL SKILL SET; LEWIS COUNTY CASE STUDY

A Thesis

Presented to

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science

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ANALYSIS OF THE INDUSTRIAL SKILL SET: LEWIS COUNTY CASE STUDY

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Morehead State University, 2013

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One major issue concerning today's economy in Kentucky and even in the United States, is available work for people utilizing their learned skills from the previous employment in manufacturing processes or education gained in the field. Since the Industrial Revolution after the Civil War when people began understanding the generation of electricity, manipulating iron into steel, and processing oil into consumables for mechanization, manufacturing has been a major contributor of employment for families across this great land. Five years after the Financial Crisis of 2008, unemployment rates are still hovering around 8% in Kentucky as job creation has stumbled and manufacturing jobs are dissipating to other regions, states, and even other countries for different reasons. This phenomenon is magnified exponentially in areas such as Eastern Kentucky and the foothills of Appalachia, where opportunities for workers are lessened due to a lack of infrastructure, existing industry and product lines available to manufacture in the area. This thesis presents the analysis of the skill set of the existing workforce to propose an approach for relocating product lines for manufacturing through new start-ups and expansion of existing companies into the Eastern Kentucky area that will match the skills needed for the product lines, therefore supporting the efforts in creating jobs and promoting economic development for the region.

The analysis has the potential to assist economic development in the region in many ways for the workforce and general population. It will lay the groundwork necessary to enhance the understanding of the potential of the workforce so further studies may be developed therefore creating more opportunities for the region through additional infrastructure such as highways

and bridges, education at all levels from high school to universities, and government agencies such as the Economic Development Cabinet.

Accepted by: Dr. Ahmad Zargari, Chair

Dr. Hans Chapman

Dr. Nilesh Joshi

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Table of Contents

List of Figures

List of Tables

CHAPTER 1: Introduction

Overview

This thesis is a case study of Lewis County in Eastern Kentucky to document the abilities of the workforce available to the area. The aim is to make recommendations upon the findings to enhance economic opportunities for the residents of the county. The study includes several other studies in the literature review that cover the demographics, the jobs available, the education level, and the capabilities of the county's workforce. The thesis will also make recommendations as to how to proceed forward in regard to continuing education and creating employment opportunities.

Assumptions

1. All data are area specific to Lewis, Mason, Fleming, and Rowan Counties in Kentucky.
2. All conclusions do not consider those unemployed without formal education.
3. All conclusions do not consider those employed without formal education.

Definitions

Diploma Program

A. A diploma program is designed to prepare students for technical employment within a one- to two-year period (36-60 credit hours). The total number of credit hours for the diploma must not exceed those required for a degree in the same program of study. A prescribed program of technical and general education courses is designed to prepare students for a specific job title.

Diploma programs provide: preparation for a specific occupation, credit toward an associate degree, and continued training opportunities for certificate program graduates.

Certificate Program

A. The primary purpose and features of certificate programs of study are to provide marketable, entry-level skills for a time period less than that required for diploma or associate degree programs. Certificates are organized programs of study consisting of courses designed to meet a defined set of competencies. Certificates qualify students to take external licensure, vendor-based, or skill standards examinations in the field. If standardized external exams are not available in the field of study, certificates prepare students at skill levels expected of employees in an occupation found in the local economy.

Requirements for a certificate are applicable to the requirements of a diploma or associate degree in the same or a related field of study. Requests for exceptions to this characteristic must accompany the documentation needed for approval.

A certificate requires completion of an academic program in less than one academic year or is designed for completion in less than 30 semester credit hours by a student enrolled full time. Certificates generally range from 12-30 credit hours. Those certificates with fewer than 12 credit hours or greater than 30 credit hours must include a compelling rationale for either a shorter or longer program.

O – NET

The Occupational Information Network (O*NET) is a database of occupational requirements and worker attributes. It describes occupations in terms of the skills and knowledge required how the work is performed, and typical work settings. It can be used by businesses, educators, job seekers, human resources professionals, and the publicly funded Workforce Investment System to help meet the talent needs of our competitive global economy. O*NET information helps support the creation of industry competency models.

The O*NET System:

- Promotes business efficiency and talent development
- Supports education of the workforce through skills training and curriculum design for regional economic development

- Facilitates career guidance and career advancement accounts

The O*NET system, using a common language and terminology to describe occupational requirements, supersedes the seventy-year-old *Dictionary of Occupational Titles* with current information that can be accessed online or through a variety of public and private sector career and labor market information systems. The O*NET system, which has been significantly upgraded and improved since its introduction and continues to undergo periodic enhancements, includes the O*NET database, O*NET Online, and the O*NET Career Exploration Tools.

Burning Glass

Burning Glass was founded in 1999 with the goal of developing the world's leading technologies for matching people with jobs and Burning Glass continues to be dedicated to this goal. Burning Glass technologies deliver intuitive insight across a range of functions, including workforce and economic development and career exploration and counseling, as well as job matching. Burning Glass is pioneering solutions leverage a deep understanding of people and their careers in order to deliver superior workforce and marketplace insight. Our patented artificial intelligence engine learns from actual career patterns as observed in both structured and natural language contexts in order to deliver an intuitive, real-time awareness of how and when people move from job to job and of the kinds of skills and experiences that lead to successful placement.

With headquarters in Boston's historic Faneuil Hall, Burning Glass is proud to serve a client base that spans six continents, including leading recruitment agencies, employers, software companies, job boards, educational institutions, and government agencies. A management-owned company founded by scientists, Burning Glass controls several active or pending patents in the fields of data extraction, information interpretation, behavioral profile generation, entity matching, and machine learning.

Organizational Behavior

The study of the way people interact within groups. Normally this study is applied in an attempt to create more efficient business organizations. The central idea of the study of organizational behavior is that a scientific approach can be applied to the management of workers. Organizational behavior theories are used for human resource purposes to maximize the output from individual group members.

NKIP

NKIP stands for Northern Kentucky Industrial Park which is the largest industrial park in Kentucky and NKIP is a 45 year old partner organization. There are 85 manufacturers in the park.

NAICS

North American Industry Classification System used in by the bureau of the census.

Problem Statement

The people of Eastern Kentucky have faced many challenges throughout history concerning basic survival and have had a choice of two ways to survive. Some of Eastern Kentucky has relied on the vast coal reserves for jobs and economic development, but other areas along the western edge of the Appalachian Mountain range do not have the coal deposits leaving those citizens without employment opportunities close to home, therefore forcing them to travel for employment. With federal regulations bearing down on the emissions that coal produces forcing energy producers to eliminate coal usage at their facilities along with the fact that some counties do not have coal to begin with, the area is being forced to adapt for survival once again by increasing the existence of infrastructure to diversify the economy of the region. This has been a rather daunting task.

The topography is rugged which makes integrating infrastructure such as highways, natural gas lines, water lines, and sewage treatment for citizens not only expensive, but difficult to engineer and install. This in turn has left Eastern Kentucky behind other regions in the state on its quest for self-reliance because the infrastructure necessary to accommodate manufacturing sites and product line development in the area has not been readily available. Over the past several years, local, state, and federal governments have emphasized integrating many of these systems such as better highways, water and sewer lines along with upgraded electric and natural gas to enhance the potential for the area in regard to attracting businesses

that would create economic development and employment opportunity for the population. Some counties, such as Lewis County, still are mired with high unemployment and struggle to grow economic opportunity despite the effort of those entities to enhance the potential of the area.

People of the area have seen some growth in other neighboring counties from manufacturing facilities such as Boneal and Glenro, Inc. Boneal, in Menifee County, has a manufacturing facility that employs several local people and does work for large companies and entities such as NASA. Glenro Inc., a New Jersey based company that manufactures heat transfer equipment and employs welders and fabricators, has found that the wages needed to retain highly skilled labor are far less in this area than in New Jersey. People that work for these companies take pride in their jobs and tend to be loyal to the company seemingly appreciative of the opportunity to make a living and be close their homes not having to travel or relocate to provide for their families.

So, why is unemployment still high in areas such as Lewis County? Why have jobs not been created there and what can be done to assist the area in economic development? Given the geographic location of the county situated along the Ohio River with railroad access in Northeastern Kentucky that has a major highway connecting two interstates running through it, the county should have an abundance of opportunity. There are three Industrial Parks strategically located in the county, so there is land available for building new sites. The entire necessary infrastructure is

apparently in place for this county and others like it to have a boom in job creation; it just needs a place to start.

This study seeks to analyze the existing industrial skill sets in place with the population that would match product lines needed to be manufactured to promote economic development and job creation for the area. By studying the skill sets already in existence in the region, an identification of what the people of this region know and the tasks they can successfully perform can be attained. Then, a recommendation can be made concerning the types of product lines to attempt to attract to the area. If understanding can be obtained concerning the potential of the population workforce, then economic development can be improved by assisting with marketing the area for economic growth.

CHAPTER 2: Literature Review

The focus of this study is on the workforce attributes of the people in the Lewis County, Ky. area. Lewis County is situated in the Northeastern part of the state along the banks of Ohio River as shown in Figure 1 below.

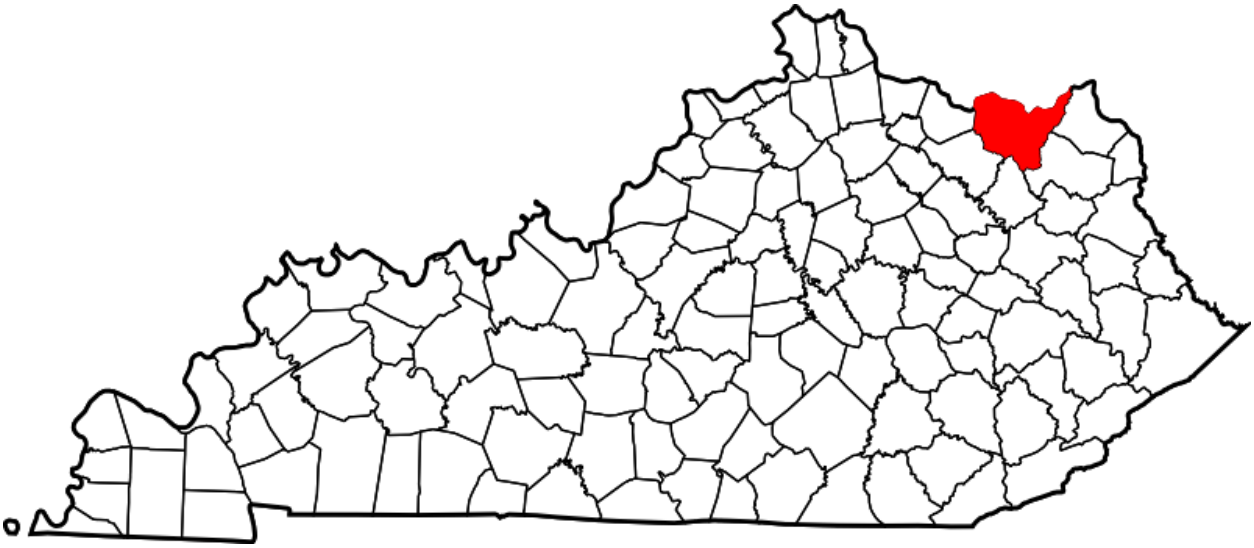

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Figure 1: Location of Lewis County in KY (wiki, 2013).

Lewis County is a highly dissected upland area in northeastern Kentucky. The topography is hilly to mountainous. On the western edge of the county, the topography is typical of the Outer Bluegrass, but elsewhere it expresses the characteristics of the Highland Rim. Ridge top elevations generally exceed 1,000 feet, and expanses of flat land are few. An exception is the Tollesboro area, where broad upland flats are developed on resistant rock formations.

The Ohio River marks the northern border. The lowest elevation in the county is 485 feet, the normal pool level of the Ohio where it crosses the western boundary. Elevations along the valley floor are about 520 t**o** 540 feet.

Local reliefs of 300 feet or more are common in many parts of the county, and slopes are steep. The greatest local relief is 2 miles west of Garrison, from Round Top (1,220 feet) on the bluff overlooking the Ohio River down to river level (485 feet), a difference in elevation of 745 feet.

The highest elevation in Lewis County, 1,400 feet, is a knob near the Lewis-Fleming County line about 2 1/2 miles south of Petersville. Elevations in excess of 1,300 feet are present along the Lewis-Fleming and Lewis-Rowan County lines, where they follow a drainage divide between Kinniconick Creek and Licking River. Escalapia Mountain, a prominent high area southeast of Tollesboro, attains an elevation of 1,200 feet.

The elevation of Vanceburg, the county seat, is 525 feet. Other elevations in the county are Burtonville, 790 feet; Charters, 583 feet; Concord, 526 feet; Firebrick, 580 feet; Garrison, 535 feet; Head of Grassy, 716 feet; Kinniconick, 686 feet; Petersville, 830 feet; Stricklett, 720 feet; and Tollesboro, 816 feet (Discussion, 2013). Refer to Figure 2.

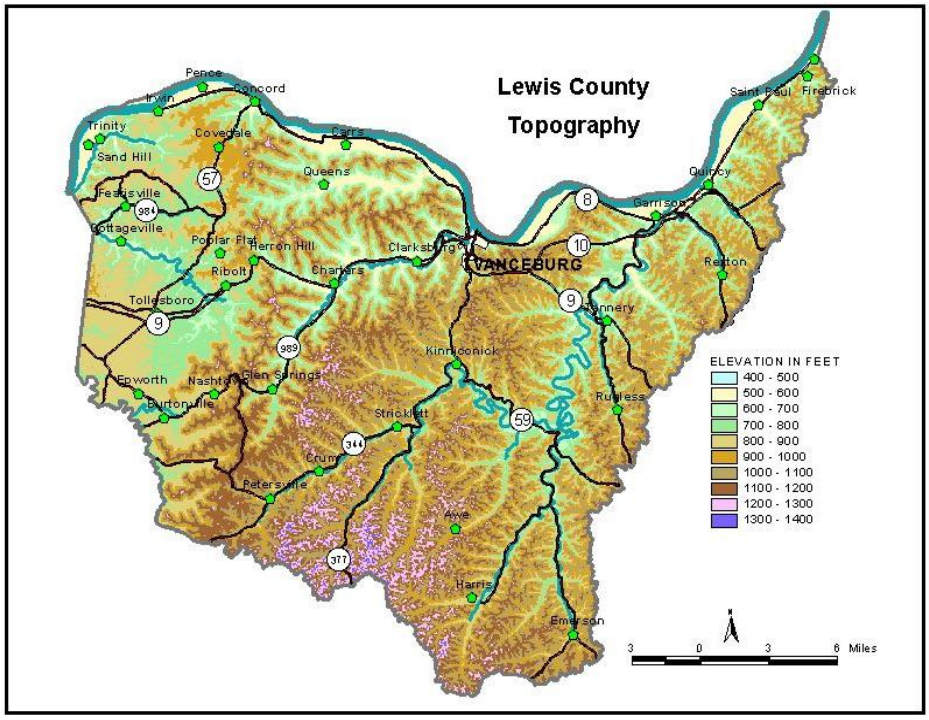


Figure 2: Topographical map of Lewis County, Ky. (uky.edu, 2013)

Table 1: Demographic table of Lewis County, Ky. (US Census Bureau, 2013).

People Quick-Facts	**Lewis County**	**Kentucky**
Population, 2012 estimate	13,835	4,380,415
Population, 2010 (April 1) estimates base	13,870	4,339,357
Population, percent change, April 1, 2010 to July 1, 2012	-0.3%	0.9%
Population, 2010	13,870	4,339,367
Persons under 5 years, percent, 2012	6.2%	6.4%
Persons under 18 years, percent, 2012	23.4%	23.2%
Persons 65 years and over, percent, 2012	15.7%	14.0%
Female persons, percent, 2012	50.3%	50.7%
White alone, percent, 2012 (a)	98.7%	88.6%
Black or African American alone, percent, 2012 (a)	0.3%	8.1%
American Indian and Alaska Native alone, percent, 2012 (a)	0.3%	0.3%
Asian alone, percent, 2012 (a)	0.1%	1.3%

Native Hawaiian and Other Pacific Islander alone, percent, 2012 (a)	0.0%	0.1%
Two or More Races, percent, 2012	0.6%	1.6%
Hispanic or Latino, percent, 2012 (b)	0.7%	3.2%
White alone, not Hispanic or Latino, percent, 2012	98.1%	85.9%
Living in same house 1 year & over, percent, 2007-2011	85.7%	84.7%
Foreign born persons, percent, 2007-2011	0.1%	3.1%
Language other than English spoken at home, percentage 5+, 2007-2011	3.1%	4.7%
High school graduate or higher, percent of persons age 25+, 2007-2011	65.9%	81.7%
Bachelor's degree or higher, percent of persons age 25+, 2007-2011	**8.8%**	**20.6%**
Veterans, 2007-2011	805	323,823
Mean travel time to work (minutes), workers age 16+, 2007-2011	**28.5**	**22.6**
Housing units, 2011	6,480	1,932,599
Homeownership rate, 2007-2011	82.3%	69.5%
Housing units in multi-unit structures, percent, 2007-2011	5.1%	17.8%
Median value of owner-occupied housing units, 2007-2011	$56,900	$118,700
Households, 2007-2011	4,983	1,681,085
Persons per household, 2007-2011	2.76	2.49
Per capita money income in the past 12 months (2011 dollars), 2007-2011	**$14,898**	**$23,033**
Median household income, 2007-2011	**$27,181**	**$42,248**
Persons below poverty level, percent, 2007-2011	**31.6%**	**18.1%**

Table 2. Demographic table of Lewis County, Ky. (US Census Bureau, 2013).

Business Quick-Facts	**Lewis County**	**Kentucky**
Private nonfarm establishments, 2011	**125**	**89,770[2]**
Private nonfarm employment, 2011	**1,317**	**1,463,173[2]**
Private nonfarm employment, percent change, 2010-2011	**3.8%**	**0.4%[2]**
Non-employer establishments, 2011	**919**	**275,059**
Total number of firms, 2007	1,192	337,600

Black-owned firms, percent, 2007	F	3.1%
American Indian- and Alaska Native-owned firms, percent, 2007	S	0.3%
Asian-owned firms, percent, 2007	F	1.6%
Native Hawaiian and Other Pacific Islander-owned firms, percent, 2007	F	0.0%
Hispanic-owned firms, percent, 2007	F	1.1%
Women-owned firms, percent, 2007	10.2%	25.6%
Manufacturers' shipments, 2007 ($1000)	**0[1]**	**119,105,421**
Merchant wholesaler sales, 2007 ($1000)	**D**	**74,680,759**
Retail sales, 2007 ($1000)	**56,840**	**50,405,925**
Retail sales per capita, 2007	**$4,074**	**$11,843**
Accommodation and food services sales, 2007 ($1000)	**3,942**	**6,300,866**
Building permits, 2012	0	9,725

Table 3: Demographic table of Lewis County, Ky. (US Census Bureau, 2013).

Geography Quick-Facts	**Lewis County**	**Kentucky**
Land area in square miles, 2010	482.84	39,486.34
Persons per square mile, 2010	28.7	109.9
FIPS Code	135	21
Metropolitan or Micropolitan Statistical Area	Maysville, KY Micro Area	

Explanation of Tables 1, 2, and 3.

1: Counties with 500 employees or less are excluded.
2: Includes data not distributed by county.
(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.
D: Suppressed to avoid disclosure of confidential information
F: Fewer than 25 firms
FN: Footnote on this item for this area in place of data
NA: Not available
S: Suppressed; does not meet publication standards
X: Not applicable
Z: Value greater than zero but less than half unit of measure shown

A review of Table 1 gives a perspective of the county's population showing that 8.8% of the population has a Bachelor's degree or higher, well below the state average of 20.6%. This does not indicate that the high school graduates from the area do not attend and graduate from colleges or universities; it implies graduates do not reside in the county after graduation due to a lack of potential opportunity in the area. The average travel time to work, at 25 minutes, is better than 5 minutes compared to the state average of 22.6 minutes showing that people are traveling farther to find opportunity in the work place making the point of a lack of potential. A closer look at Table 1 shows that the manufacturers' shipments were so low that they did not count in the scope and retail sales in the county and account for less than 1% of the state's manufacturing shipments. This data review shows that there is plenty of room for improvement for the 482 square mile land mass concerning opportunity for its population.

This information equates to a major problem. Per capita money in 2011 dollars for the population is $14,898 compared to the state average of $23,033. The $14,898 is 65% of the state average for per capita income of $23,033 which equates to 31% of the households in Lewis County living at or below the poverty level while the state's average is 18.1%. According to the Lewis County Superintendent's Office, 75% of the school's population is eligible for free or reduced lunch. That is a staggering number and validates the need for job creation.

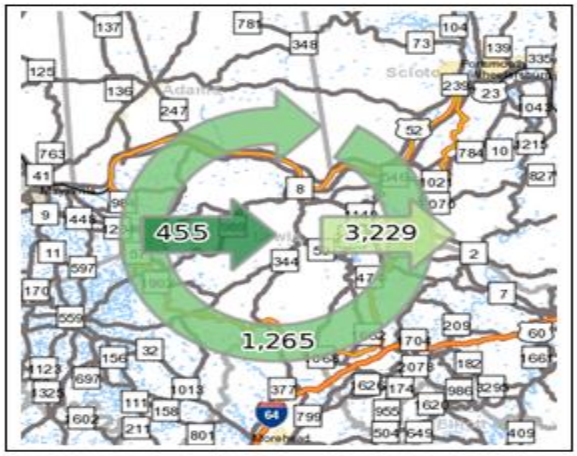
So, if 31% of the county lives at or below the poverty level and there are no real jobs that are not agricultural based in the county such as manufacturing or

industrial, then what about the 69% of the individuals that are above the poverty line.

How do those people gain employment and where do they go for that employment?

What kind of jobs does the population travel to do at different locations?

Inflow/Outflow Report



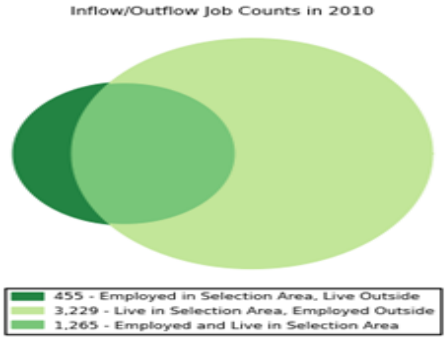
Analysis Selection

Note: Overlay arrows d directionality of worker home and employment

Employed and Live in Selection Area

Employed in Selection Live Outside

Live in Selection Area, Employed Outside

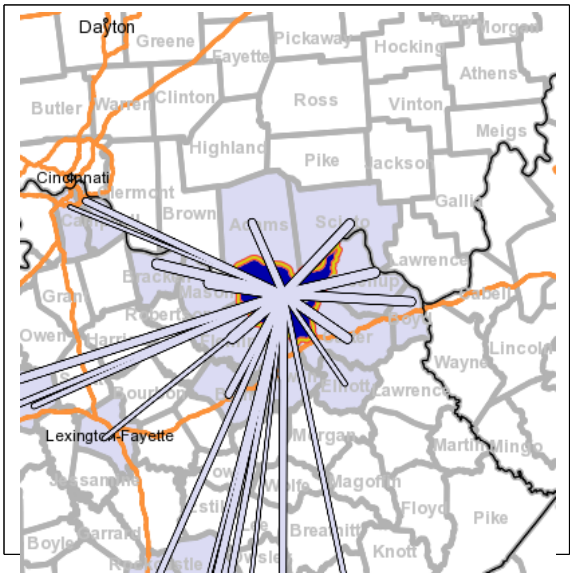


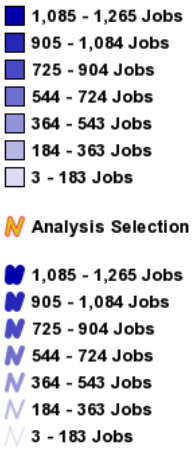
Inflow/Outflow Job Counts (All Jobs)

	2010 Count	2010 Share
Employed in the Selection Area	1,720	100.0%
Employed in the Selection Area but Living Outside	455	26.5%
Employed and Living in the Selection Area	1,265	73.5%
Living in the Selection Area	4,494	100.0%
Living in the Selection Area but Employed Outside	3,229	71.9%
Living and Employed in the Selection Area	1,265	28.1%

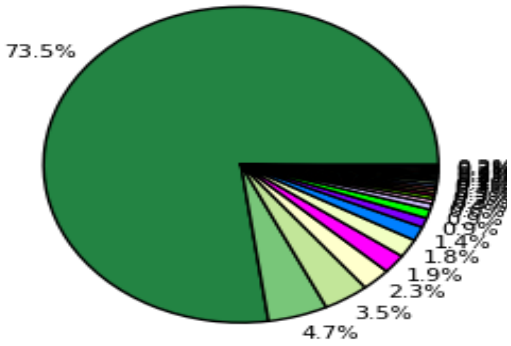
Figure 3: People live in Lewis County, work in Lewis County, come to Lewis County to work and both live and work in Lewis County (Workforce, 2013).

Home Destination Report - Where Workers Live Who are employed in the Selection Area - by Counties





Job Counts by Home Counties in 2010 All Workers



Note: Jobs in All Other Locations (4.8%) are not shown in chart.

Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2010). Notes:

1. Race, Ethnicity, Educational Attainment, and Sex statistics are beta release results and only available for 2009 and 2010 data.
2. Educational Attainment is only produced for workers aged 30 and over.

Figure 4: Shows the many workplaces and the distances Lewis Countians drive to find work (Workforce, 2013).

Table 4: Where people that work in Lewis County live (Workforce, 2013).

Jobs Counts by Counties Where Workers Live - All Jobs

All Counties	1,720	100.0%
Lewis County, KY	1,265	73.5%
Mason County, KY	80	4.7%
Fleming County, KY	61	3.5%
Greenup County, KY	39	2.3%
Bracken County, KY	32	1.9%
Carter County, KY	31	1.8%
Scioto County, OH	24	1.4%
Boyd County, KY	16	0.9%
Rowan County, KY	15	0.9%
Jefferson County, KY	10	0.6%
Adams County, OH	7	0.4%
Laurel County, KY	6	0.3%
Bath County, KY	5	0.3%
Bell County, KY	5	0.3%
Campbell County, KY	5	0.3%
Rockcastle County, KY	5	0.3%
Whitley County, KY	5	0.3%
Daviess County, KY	4	0.2%
Franklin County, KY	4	0.2%
Harlan County, KY	4	0.2%
Elliott County, KY	3	0.2%
Fayette County, KY	3	0.2%
Jackson County, KY	3	0.2%
Kenton County, KY	3	0.2%
Knox County, KY	3	0.2%
All Other Locations	82	4.8%

As Figure 3 shows, there are only 455 people that do not live in the county who come to a job in the county compared to the 3229 people that must leave the county for employment. That is approximately 7 people to 1 that must leave the county to find employment to provide for their family while 1265 people live and work in the county.

Table 4 show from where non-resident workers originate. The data tells us that there are 1720 jobs in the county, (1265 + 455), but the data also represents that 455 people come from elsewhere to gain employment. 73.5% of the workforce live in county and work while 31 % of the 455 constituents come from Mason and Fleming counties. The remaining people come from a variety of counties, but most are just commuting from neighboring counties driving a small distance.

Figure 4 depicts the distances that the workforce will travel from the home county to other counties to work. Some travel to Cincinnati, Ohio, Lexington, Ky., Portsmouth, Ohio, among others. Table 2 shows where people in Lewis County travel to find employment opportunities in a variety of fields.

Table 5 indicates where people that go to the 3229 jobs that are not in the county go to to find employment. Mason county has 597 Lewis county natives that work in their county, Fayette county has 208, and Boyd and Greenup counties each have 200. This table indicates the extremes that Lewis County natives must go to to find employment opportunties.

Table 5: Counties people living in Lewis County go to find employment (Workforce, 2013).

	Count	Share
Mason County, KY	597	13.3%
Fayette County, KY	208	4.6%
Boyd County, KY	200	4.5%
Greenup County, KY	200	4.5%
Scioto County, OH	195	4.3%
Rowan County, KY	155	3.4%
Carter County, KY	149	3.3%
Fleming County, KY	148	3.3%
Jefferson County, KY	118	2.6%
Kenton County, KY	78	1.7%
Campbell County, KY	63	1.4%
Boone County, KY	55	1.2%
Brown County, OH	55	1.2%
Hamilton County, OH	48	1.1%
Clark County, KY	46	1.0%
Franklin County, KY	46	1.0%
Madison County, KY	46	1.0%
Franklin County, OH	40	0.9%
Montgomery County, KY	37	0.8%
Scott County, KY	33	0.7%
Pendleton County, KY	30	0.7%
Bracken County, KY	28	0.6%
Adams County, OH	22	0.5%
Bourbon County, KY	21	0.5%
All Other Locations	611	13.6%

The data has now indicated that there are 1720 jobs in Lewis County total and that 455 people come into the county to work and 1265 people live plus work in the county. But , who works these jobs? What are the races, education level, and other factors of those that make up the workforce in the county? Table 6 will present information regarding these questions.

Table 6: Demographic of the jobs in Lewis County (Workforce, 2013).

Total All Jobs

	2010 Count	Share
Total All Jobs	1,720	100.0

Jobs by Worker Age

	2010 Count	Share
Age 29 or younger	336	19.5
Age 30 to 54	1,066	62.0
Age 55 or older	318	18.5

Jobs by Earnings

	2010 Count	Share
$1,250 per month or less	487	28.3
$1,251 to $3,333 per month	869	50.5
More than $3,333 per month	364	21.2

Jobs by NAICS Industry Sector

	2010 Count	Share
Agriculture, Forestry, Fishing and Hunting	0	0.0
Mining, Quarrying, and Oil and Gas Extraction	0	0.0
Utilities	32	1.9
Construction	61	3.5
Manufacturing	**325**	**18.9**
Wholesale Trade	26	1.5
Retail Trade	164	9.5
Transportation and Warehousing	46	2.7
Information	13	0.8
Finance and Insurance	68	4.0
Real Estate and Rental and Leasing	13	0.8
Professional, Scientific, and Technical Services	17	1.0
Management of Companies and Enterprises	0	0.0
Administration & Support, Waste Management and Remediation	12	0.7
Educational Services	**456**	**26.5**

Health Care and Social Assistance	**286**	**16.6**
Arts, Entertainment, and Recreation	0	0.0
Accommodation and Food Services	105	6.1
Other Services (excluding Public Administration)	19	1.1
Public Administration	77	4.5

Jobs by Worker Race

	2010	
	Count	**Share**
White Alone	1,698	98.7
Black or African American Alone	9	0.5
American Indian or Alaska Native Alone	6	0.3
Asian Alone	1	0.1
Native Hawaiian or Other Pacific Islander Alone	1	0.1
Two or More Race Groups	5	0.3

As mentioned before, there are 1720 jobs in Lewis County, Kentucky that consists of a workforce that is, according to the data in Table 4, between the ages of 30 to 54 (62%) and primarily white at 98.7%. The largest employer in the county is the Education System at 26.5% of the jobs in the county being directly related to that service while manufacturing ranks second at 18.9% and Health and Social Service is third with 16.6%. This means that 751 (44%) of the 1720 jobs in the county are related to government funds through the school system or health services, not private fundings. Monthly incomes are not very high as better than half of the population (50.5%) make between $1,251 and $3,333 a month making it clear the effects of having only 8.8% of counties population with a Bachelors Degree or higher.

For a review of the data covered to this point, we know how many jobs are in Lewis county, how many people work in the county, and how far some of the people in the county drive to find employment opportunities. But what kind of jobs are all of the citizens in the county doing wherever they are working? Table 5 breaks down the 4494 jobs that all of the citizens perform no matter the location of the employment opportunity.

Table 7: Demographic of the jobs in Lewis County (Workforce, 2013).

Home Area Profile Report

Total All Jobs

	2010 Count	Share
Total All Jobs	4,494	100.0

Jobs by Worker Age

	2010 Count	Share
Age 29 or younger	958	21.3
Age 30 to 54	2,763	61.5
Age 55 or older	773	17.2

Jobs by Earnings

	2010 Count	Share
$1,250 per month or less	1,081	24.1
$1,251 to $3,333 per month	2,199	48.9
More than $3,333 per month	1,214	27.0

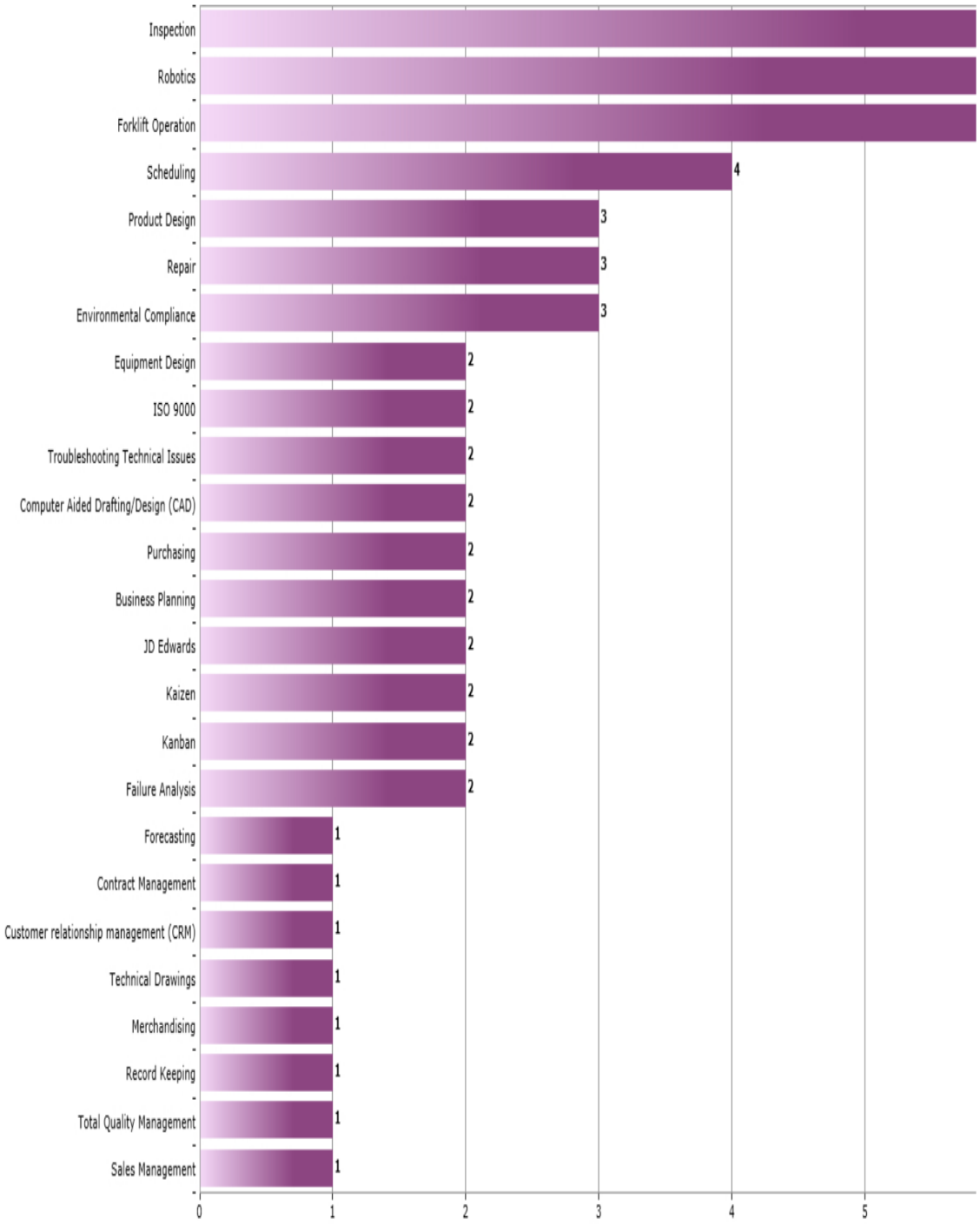
Jobs by NAICS Industry Sector

	2010 Count	Share
Agriculture, Forestry, Fishing and Hunting	11	0.2
Mining, Quarrying, and Oil and Gas Extraction	27	0.6
Utilities	98	2.2
Construction	244	5.4
Manufacturing	**905**	**20.1**
Wholesale Trade	161	3.6
Retail Trade	**596**	**13.3**
Transportation and Warehousing	148	3.3
Information	53	1.2
Finance and Insurance	127	2.8
Real Estate and Rental and Leasing	46	1.0
Professional, Scientific, and Technical Services	88	2.0
Management of Companies and Enterprises	24	0.5
Administration & Support, Waste Management and Remediation	128	2.8
Educational Services	**577**	**12.8**
Health Care and Social Assistance	**691**	**15.4**
Arts, Entertainment, and Recreation	20	0.4
Accommodation and Food Services	251	5.6
Other Services (excluding Public Administration)	72	1.6
Public Administration	227	5.1

Referring back to Table 6 which refers to the jobs that were currently in Lewis county in 2010, Education Services (456) ranks first in the county for people employed in the county with manufacturing (325) coming in second and Health Care (286) coming in third. Table 7 represents something entirely different when addressing the entire workforce in the county having 905 of the 4494 people (20.1%) working in manufacturing. Health Care and Social Assistance is second on the list with 691 (15.4%), Retail Sales is third with 13.3%, and Education Services is fourth with 12.8%. If the review of Table 1 is compared to this finding in the column of the percent of population in the county with a Bachelor degree or higher at 8.8% of the population, that would certainly support this notion. The majority of people in Lewis county are working in manufacturing in some capacity in different locations throughout the area and the state.

Now that it has been established that a majority of the Lewis county workforce is working in manufacturing, what are some of the skill sets that those existing manufacturers are expecting from their employees? A review of data from Burning Glass may shed some light on this. The data was taken for the service areas of Maysville, Kentucky and Morehead, Kentucky.

Table 8: Describes the types of jobs available in the area (Burning Glass, 2013).

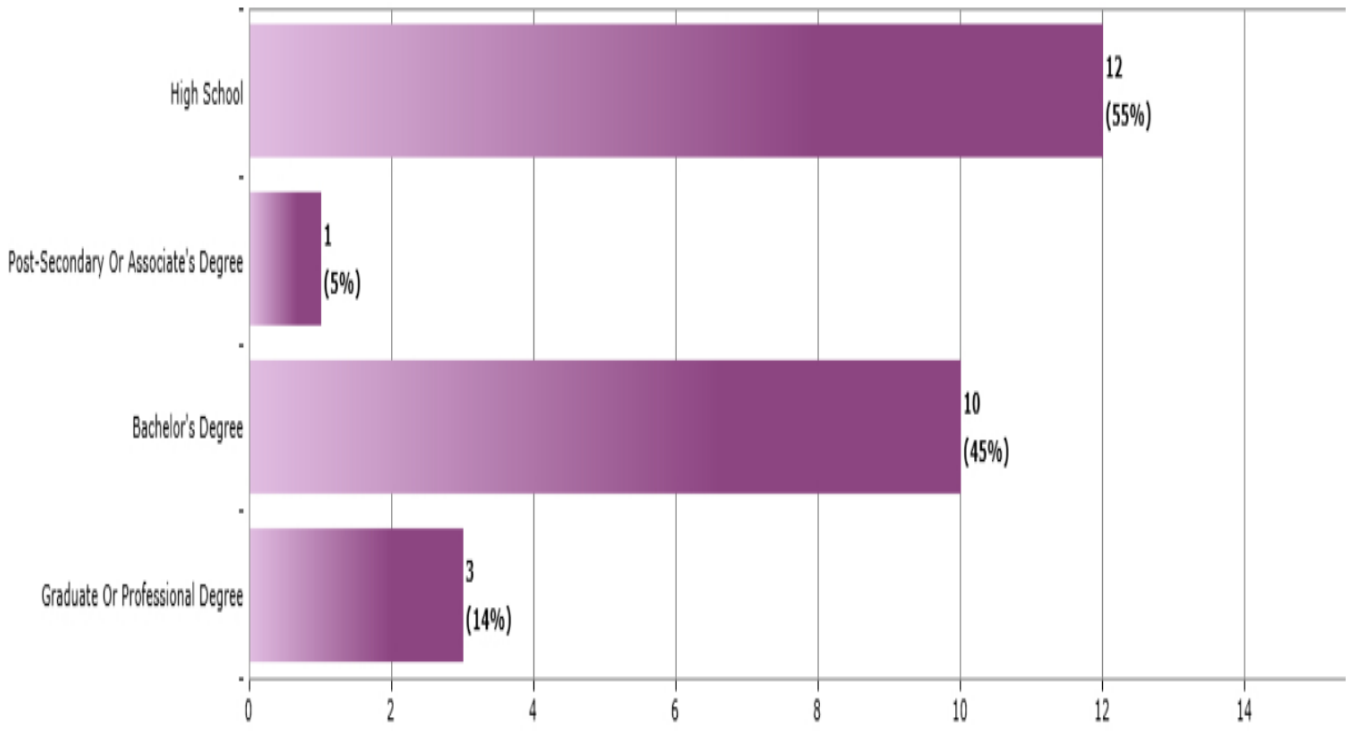


This chart was generated using filters of the locations, Maysville and Morehead, using manufacturing as a guideline. This produced 26 postings that had the resulting information in regards to potential manufacturing employment opportunities.

Inspection, Robotics, and Forklift operators were the most prevalent occurance, five a piece, of the 26 jobs in the targeted areas showing a diverse need for the existing manufacturers looking to hire from the workforce. Four people were needed to do scheduling and three were needed to assist with Product Design, Repair, and Environmental Compliance. There are many potential areas that have just one or two possiblities including Kaizen, Technical, and Purchasing to name a few. This data shows a very diverse need in the service area of Lewis county and is an example of the opportunities that are out there for potential employment.

The area has a diverse need in manufacturing, although not in large numbers, Manufacturing companies in the area are diverse from automotive to sawmills and some injection molding processes. Even though the larger manufacturers have vacated the area and none of the companies employ more than 400 people in one area, there are some potential jobs to be garnered. Of the jobs that are availbale to the citizens in the area without the two hour one way drive, what education is needed to fulfill the requirements of the positions available? Table 9 is a representation of the educational requirements necessary for the existing openings.

Table 9: The educatioal requirements of the jobs in the area (Burning Glass, 2013).



Reviewing Table 9 exposes the fact that better than half of the available jobs (55%) in manufacturing only a require a high school diploma or equivalent. There is only one job that an Associate Degree will assist the candidate with while the other 10 of the 26 require a Bachelors Degree. This again shows the diversity of the skill level that manufacturers need in the workforce for the tasks to be completed at their facilities.

The area has some opportunities with manufacturing, but what products are manufactured by what companies in the area? A review of the Chamber of Commerce information for Mason,

Fleming, and Rowan counties in regard to the manufacturers in the area shows who the manufacturers are and what they manufacture.

A review of Table 10 shows that Fleming county has 6 manufacturing companies 2 of which are in the Automotive Industry supply chain manufacturing components out of steel and metal forming for seats and grills. Two other industries are using wood as the raw material manufacturing pallets and vents for registers while the two remaining industries are plastic and agriculture. These manufacturing facilties are employing 365 people in the area.

These jobs are small in number but are very diverse with a multitude of skills needed to successfully fulfill the requirements of the jobs that are present. It shows that the people in the region who are employed in these positions are good with their hands and have enough process knowledge to be successful. They also have a good working knowledge of machinery and the capabilites of those machines to manipulate them to do the process.

Table 10: Prominent manufacturing industries in Flemingsburg and Fleming County (Fleming Commerce, 2013)

A. Raymond Tinnerman Manufacturing, Inc.
Bill Breeze - bbreeze@tpepinc.com
525 Mt. Carmel Avenue, Flemingsburg, KY 41041
PH: 606-845-2511
Web site: www.tinnerman.com/en/
Automotive and appliance parts
57 Employees

Appalachian Floor Vents
Gene Justice - President
308 E. Water St., Flemingsburg, KY 41041
PH: 606-845-1030
Hardwood floor registers, floor vents
15 Employees

GreenTree Forest Products
James D. Wells
746 Muses Mill Rd., Wallingford KY 41093
PH: 606-876-5551
Web site: www.greentreeforest.com/
Sawmill, pallet shop/skids, lumber grading station
50 Employees

Ridley Block Operations
Jeremy Faulkner
334 Industrial Drive, Flemingsburg KY 41041
PH: 606-849-2170
Web site: www.ridleyinc.com/
Agricultural
37 Employees

Riverside Plastics, Inc.
Sharon Roy - President
P.O. Box 421, Flemingsburg, KY 41041
PH: 606-849-3383
Web site: www.riverside-plastics.com/
Plastic flower pots, boat parts, livestock equipment
15-20 Employees

Toyo Seat, USA
Johnny Smith - jsmith@toyoseat.com
112 Toyo Drive, Flemingsburg, Ky 41041
PH: 606-849-3009
Web site: www.toyoseat.com
Manufacturer of automobile seat tracks and latches
186 Employees

Rowan County has several manufacturing employers as well including Emerson Electric employing approximately 80 people, SRG Global with 150 employees, and Morehead Machine with 10, utilizing the metal removing, metal forming skills that people of the area have. They are showing some growth in the manufacturing sector capitalizing on the hardwood resources of the area with Stave Bourbon Barrels coming to the area which is going to employ 70 more people. The Rowan county area has about 310 manufacturing jobs from which the surrounding population can garner employment (Rowan Chamber, 2013).

Table 11: Mason County industrial jobs (Maysville / Mason County Chamber of Commerce)

Employer	*Number of Employees*
Dayton Power & Light	521
East Kentucky Power Co-op Spurlock Power Station	210
Federal Mogul	200
International Paper	174
Stober Drives	98
Green Tokai	248
Mitsubishi Electric Automotive America	207
Carmeuse Lime	176
Emerson	140

There are 1974 industrial jobs located in the Mason County region with electrical generation making up 731 jobs for welders, fitters, and maintenance workers and process controls as well as a paper company that has similar needs of its employees. Green Tokai and Mitsubishi Electric Automotive America are both automotive manufacturers and Emerson and Stober Drives are gearing and sheave manufacturers. There are other smaller companies in Maysville not shown in the list that manufacture products such as Glenro that employs 25 to 30 people, but the list was comprised of the main ones due to sheer amount of employment opportunities present (Mason, Chamber, 2013).

Lewis County has much more land mass than all of these counties, but it does not have near the manufacturing available. Coroplast is North America's market share leader and largest manufacturer of corrugated plastic sheet for signs and re-usable packaging that employs about 115 people. Superior Fibers has developed a significant leadership position in several key markets. Residential and commercial HVAC air filtration, Fiberglass reinforcement materials, Fiberglass Filter Media, and polyester fiber media are Superior Fibers main products

and they employ about 75 people. Northern Contours has been highly recognized for their excellence in the manufacture of wood, veneer, thermofoil cabinet doors and components to a variety of industries and employs 60. Rips Farm Center is an agribusiness that employs 15 and there are several sawmills in the county which employ about 50 total (Lewis Chamber, 2013). All of these total about 315 manufacturing jobs in the county.

Now that the knowledge is drawn to what is in the area in regards to manufacturing, the question must be asked as to why it is important to match the skill set of an existing workforce to a product line? To respond to this, it is important to focus on the organizational behavior aspect of product line development and the direct relationship with employees as fundamental to the success of any organization.

In any organization, leadership should look to empowering its people for success in their field. The combined behaviors create a company climate that can bolster or undermine an organization's success. Operating from within a company's system, both management and staff might have difficulty recognizing patterns of behavior and also how profoundly those patterns can influence a company's performance. To make sure that influence is positive, leaders must help others grasp the importance of organizational behaviors so that everyone involved in a company's future can better understand and shape the internal conditions of an organization (smallbusiness, 2013). There is no better way to do that than to create a feeling of comfort and experience in the area in which the organization is concentrating its efforts in the market place. A paper written by Mahmud Zaman and copyrighted in 2003 shows this importance and how the views have changed over the last several years in regards to the most important asset in an organization.

Organizations are all around us. We are born in an organization, we live, work, and most probably will die in an organization. Yet most of us do not understand how people function, behave and interact between each other within these organizations. We also do not understand if people shape an organization or an organization shapes people.

In the beginning, people create an organization and shape its mission and culture and later more people join the organization. This new group of people adjust themselves within the existing organizational culture. Sometimes they also influence organizational culture by bringing new and unique skills to the organization. Sometimes they learn from each other and at other times, external forces like competition and political and cultural changes compel them to learn new technical, communication or interpersonal skills. All these internal and external factors help an organization and its people to evolve to cope with the ever-changing world.

Until recently, managers paid little attention to Organizational Behavior or soft skill training. The industrial revolution created the need for hard (technical) skills. People worked in the production line and were not required to think or interact with each other. However, things have changed; instead of standing behind the production lines, they now sit in front of a computer and control a robot who works in the production line. Now, people need more technical skills, but they also need skills to communicate and work within a group.

The great English poet Samuel Butler put it together more eloquently, "Any fool can paint a picture, but it takes a wise man to be able to sell it." If the "fool" is the metaphor for hard skill then the "wise man" would be the soft skill; but the soft skill of the wise man is useless without the hard skill of the fool; the harmonizing of both skills sells the picture. Therefore, the

study of Organizational Behavior is not considered pop psychobabble anymore. A comparison between old and new organizations makes the picture clear.

Old Organization vs. New Organization

In his book *Power Up: Transforming Organizations Through Shared Responsibility Leadership,* Stanford professor of Organizational Behavior David L. Bradford pointed out three major distinctions between an old static organization and new organization powered by Interpersonal Dynamics (cited in Zich, 1998).

First, in old organizations, machinery used to be considered as a primary asset, and in order to maximize productivity the managers needed to concentrate on 100% usage of that machinery. Later, people became the most important asset of the new organization and organizations are finding ways to use the "whole person". According to Bradford, within the last ten years, usage of human capital raised from 20 percent to 40 percent. Second, in the new organization everyone is responsible for the whole process. The old organizational attitude was "you are responsible for your area and I'm responsible for mine and if you screwed up, that helps me to look better." But the new organizational attitude is all about "powering up", according to Bradford, and “increasing the total power of each individual, every unit, and the entire organization." Old organizational layers are slowly melting together and the words 'superior' and 'subordinate' are becoming obsolete. For example, in his company, everyone has the same title 'benefits consultant' and the difference between managers and consultants is defined by the word 'senior'. Finally, in the old organization it was always presumed that the bosses knew the solution to all problems; according to Bradford, "the traditional organization is anti-learning." In the old organization, managers used to show up in the meetings with a solution. New organizations are

constantly evolving and in this new environment, managers are not ashamed to admit they need input and assistance.

The new organizational paradigm - people focused thinking which is based on healthy communications and supportive leadership (Hayes, 2001), has been receiving a lot of attention in recent years. At the same time, the demand for hard skills has also increased - the technologically advanced society demands a more analytically and technologically savvy workforce. Therefore, the challenge is to develop human capital with the perfect combinations of hard and soft skills. Political economist Robert Reich recommended that the hi-tech companies to focus more on human capital than high volume production. He said in order to attract employees and reduce turnover, companies must create an environment that fosters learning and responsibility and encourage group ownership in a common mission (Ricadela, 2000).

Therefore, the previously perceived notion that this hi-tech, high paced environment would cause stiff cutthroat competition among workers and create tyrannical corporate environment never materialized. Instead, we are observing more and more cooperation and support among workers.

Recent research shows that soft skill training should start at the University. Graham and Krueger (1996) pointed out that soft skills are not well-appreciated and understood among students - students consider decision making and computer and math competencies as the most important skills. However, an extensive study done on career paths of corporate CFOs by Baker and Phillips (1999) show high level of importance put on soft skills by the CFOs. The following table (Baker & Phillips, 1999, p. 48) shows the most important skills that someone should acquire to be a CFO:

Table 12: Skills desired in a CFO. (Zaman, 2013)

Skill	Percentage
Communication (Oral and Written)	13.3%
Management and Leadership	12.4
Financial (e.g. Cash Management and Financial Analysis)	10.1
People and Interpersonal	9.5
Analytical and Critical Thinking	9.1
Technical (e.g., Mathematics and Statistics)	7.4
Accounting and Taxation	6.3
Computer	4.4
Negotiation	1.7
Other (e.g., Foreign Language, Strategic Planning and Organizational Skills)	25.7
Total	100.0%

The next table (Baker & Phillips, 1999, p. 48) shows the gaps between what business schools teach and what companies need for entry-level finance positions:

Table 13: Entry level requirements for finance position (Zaman, 2013).

Gap	Percentage
Real World and Work Experience	17.2%
Communication Skills (Oral and Written)	13.3
Management and Leadership Skills	6.7
People and Interpersonal Skills	7.7
Financial Skills (e.g., Cash Management)	4.9
Accounting and Taxation Skills	5.9
Analytical and Critical Thinking Skills	4.2
Computer Skills (e.g., Spreadsheet)	3.9
Ethics	2.8
Other (e.g., Self-Development, Investment Theory)	33.3
Total	100.0%

To summarize the research on Organizational Behavior, there is more evidence that the teaching and implementation of soft skills should get higher priority in education and company training process, but it should only complement hard skill, not substitute for it.

Today's postindustrial hi-tech organization requires knowledge intensive work environment and demands creativity from its workers. Most organizations are now encouraging a team approach to solve problems. Workers do not only need to learn new technical skills but also how to communicate, delegate, negotiate, and motivate with each other (Zaman, 2013).

From this analysis and conclusion it has been determined that hard skills are important, but soft skills are just as important for people to know to be productive members of the organization. The beauty of this scenario is that by identifying the hard skills needed to successfully develop product lines in this area, then that only leaves the soft skills for the organization to hone to be successful. The organization will not be having to “reinvent the wheel” so to say and will have a good start on being a productive, self-relying entity which can turn a profit and make the necessary adjustments to be competitive. The only thing to convey to the employees is the culture necessary to effectively communicate the issues of the company while utilizing the hard skills already in place.

The other benefit to matching product lines to the workforce is training. Training presents a prime opportunity to expand the knowledge base of all employees, but many employers find the development opportunities expensive. Employees also miss out on work time while attending training sessions, which may delay the completion of projects. Despite the potential drawbacks, training and development provides both the company as a whole and the individual employees with benefits that make the cost and time a worthwhile investment (smallbusiness, 2013). If a

skill set of the workforce matches the needed skill set determined to successfully produce the product, then the need for training is diminished considerably. That is not to say that certain aspects of the company or the product line will not need some training and familiarization with the way the work is to be completed, but to have the assessed hard skills in place will allow for enhanced training opportunities and will allow for the organization to grow at a much quicker pace. An employee who receives the necessary training is better able to perform her job. She becomes more aware of safety practices and proper procedures for basic tasks. The training may also build the employee's confidence because she has a stronger understanding of the industry and the responsibilities of her job. This confidence may push her to perform even better and think of new ideas that help her excel. Continuous training also keeps your employees on the cutting edge of industry developments. Employees who are competent and on top of changing industry standards help your company hold a position as a leader and strong competitor within the industry (smallbusiness, 2013).

Other studies of this kind have been done, but in a reverse nature to this one. The Northern Kentucky Industrial Park (NKIP) and Rick Jordan did a study analyzing the number of manufacturing jobs in Boone, Kenton, and Campbell counties south of Cincinnati, Ohio. The Northern Kentucky Region currently employs over 20,000 people in manufacturing with an average wage of over $54,000 per year. Even with high regional unemployment, the local manufacturers are experiencing shortages in the advanced skilled workforce that is beginning to affect the ability to meet their production requirements. As we look at the pipeline requirement horizon, meaning the future needs of these job positions, there is a new phenomenon affecting our workforce which is the retirement of the baby boom generation (NKIP, 2013).

The Northern Kentucky manufacturing community has been attempting to address the skill shortage problem with the funding of apprenticeship programs in which the company not only hires the employee but also pays for all schooling at the area community and technical college. In 2013, there are 53 employees going through the apprenticeship program. Also companies are funding various advanced manufacturing Boot Camps for their employees along with many producing videos and brochures about the apprenticeship programs along with the increasing cost absorbed for advertising the open positions. Also, over 85 percent of the manufacturers provide some type of tuition assistance (NKIP, 2013).

However with the increasing number of skilled openings currently experienced and future skilled needs, the manufacturing community competitive cost will not be sustainable. To this end, the Northern Kentucky Manufacturers must solicit the involvement of the local stakeholders to work together to create a sustainable skilled workforce pipeline (NKIP, 2013).

In order to understand our future skill requirement workforce needs taking in consideration of growth and the retirement of the baby boomers, NKIP, through an Industry Partnership Grant, hired Re-pass and Partners in 2012 to conduct and intensive survey selecting 19 advanced manufacturing positions. The survey not only took in account the 19 positions out 10 years but also the core competencies for each of those positions. The results were quite astounding indicating there are 680 positions currently open today, 2500 in three years and 6,250 skilled positions in 10 years. Retirements created over a 50 percent impact on the skilled production workers, engineering and supervision (NKIP, 2013).

The second part of the NKIP study was to determine why there is a shortage in manufacturing pipeline. To determine a reason for the shortage, focus groups were held with

high school students, parents, teachers, counselors, and displaced workers to identify the current perception of manufacturing and ways to increase current and future advanced manufacturing positions. The results of the focus groups identified that the manufacturing industry is misunderstood by many, outsourcing has damaged the perceived opportunity in the industry, manufacturing jobs are mundane, and no career opportunity (NKIP, 2013).

The results of the study showed a striking contrast in that region of the state versus this region in regard to the amount of employment opportunity. The results are as follows;

- Eleven percent (11%) of the Northern Kentucky Workforce is in Manufacturing.
    - Average annual manufacturing wage in Boone, Kenton, & Campbell is $55,040 and with benefits it totals $70,782.
    - The annual economic impact for each manufacturing job in Northern Kentucky is $205,000. In addition, each manufacturing job provides annually $14,250 on state and local taxes.
        - NOTE: Provided by the Office of Research and Public Affairs through the Cabinet for Economic Development.

- With a 7.2 Percent Unemployment Rate (May 2013) or 14,245, there are currently over 680 Advanced Manufacturing Positions in Northern Kentucky that cannot be filled.

- THIS Number grows to 2,500 in Three Years.

- During the next ten years, this totals 6,250 Advanced Manufacturing Positions. Those Jobs Include:
    - 3,283 Manufacturing Technicians, Machinists, CNC Brake Set-up & Operators
    - 1,445 Machine Maintenance Specialist, Electronic Technician, Industrial Electrician
    - 924 Design Engineer, Process Engineer, Application Engineer & CAD Drafters
    - 502 Welders consisting of MIG & TIG on Steel & Aluminum; Finishers
    - 96 Metal Fabricators
        - NOTE: Does not take in account any new manufacturing companies moving into the Northern Kentucky Area.

- Bottom Line Numbers
    - With 6,250 advanced manufacturing positions needed throughout the next 10 years, which means we need 625 each year.
    - There are 3,500 Northern Kentucky Graduates each year. If we persuade 10% to enter an advance manufacturing career, that provides 350. We need to recruit 275 from other areas such as veterans, unemployed/displaced workers, and retirees.

(NKIP, 2013)

These findings show what our region could be. The NKIP region is in need of this many employees for the manufacturers that they have in place and some of our regional citizens are filling those jobs but driving many miles to do it according to the diagram listed on Figure 4 of this paper. With all of this information, it is time to take a look at what the workforce of this area has in place and the skills they have achieved to put in place.

CHAPTER 3: Methodology

This study is intended to analyze the skill set of the population in Lewis County and the surrounding areas to determine what types of industries that can be established to accelerate the economic development of the region. The conclusions from this paper will assist in identifying what types of opportunities to market the area toward, how to enhance educational criteria to build on the working knowledge of the workforce in place, and give economic development cabinet members a direction while trying to develop the area with infrastructure.

The data for this analysis was obtained from a four county area in Kentucky including Lewis, Mason, Fleming and Rowan counties. The purpose of the data was to show what the workforce was trained to do by educational institutions such as high schools, the KCTCS system in Morehead and Maysville, Morehead State University, as well as the displaced workers in the region that may or may not have any formal training but have had on-the-job experience. Lewis, Fleming, and Mason counties all graduated students with certifications such as welding and auto mechanics from their institutions but Rowan county did not as the adult population at the KCTCS did not have enough room for them to graduate with the extra certifications. They only offered the classes to seniors who could complete the program the following year. The vocational programs at the high school level offered certifications in health and beauty, but those students were disregarded in this study as this study is focusing on the types of product lines to attempt to attract to the area based on the manufacturing skills set of the people in the workforce.

The data was gathered by means of telephone and email communication. The selected school systems were asked about their graduate information as was the KCTCS system. This information was collected and saved for the analysis to give the direction necessary for the

industrial skill set of the people. The information was gathered on trades that were utilized in manufacturing industries such as Welding and Carpentry in the high schools and other manufacturing needs such as Automotive, Machinist, Energy Systems, Electrical Engineering, and Industrial Maintenance MCTC. All others such as Nursing and Cosmetology were not included in the data collection.

CHAPTER 4: Data Analysis

The data below was gathered from Lewis County High School, Buffalo Trace Area Development concerning the displaced workforce skills, and MCTC (KCTCS). The analysis of the High School was taken from 2010 through 2112 and included all graduates that received a high school diploma and an industrial certification of some kind such as welding or carpentry. All other occupational areas were not focused on in this study.

The Buffalo Trace data shows the displaced workers information and the skill sets that have been obtained through the previous employment from which they have been displaced. This data will show what the people that have lost jobs have experience in and what is needed to support them based on their work history.

The MCTC data shows the completion skill level for the last five years. The data set breaks down the skill sets for the industrial department and gives a sense of direction as to where the institution needs to focus more. The data was taken from the Industrial Division of KCTCS, not regarding the medical or cosmopolitan areas, but just the industrial completion areas such as Welding, Energy Systems, HVAC, Electrical and Industrial Maintenance fields.

These are the data that will be analyzed to make the recommendations and draw the conclusions on at the end of this section.

Table 14: Data Set for welding studies for Lewis County High School for 2011, 2012, and 2013.

KW = Kossa Welding **KC = Kossa Carpentry** **KCAD = Kossa CAD** **DA = Drafting Assistant** **GW = Gas Welder** **WH = Welder Helper** **PLW = Production Line Welder**			
Type	**2010-2011**	**2011-2012**	**2012-2013**
KW	0	11	7
KC	0	7	7
KCAD	7	3	1
DA	10	3	1
GW	19	16	22
WH	15	13	2
PLW	10	2	0

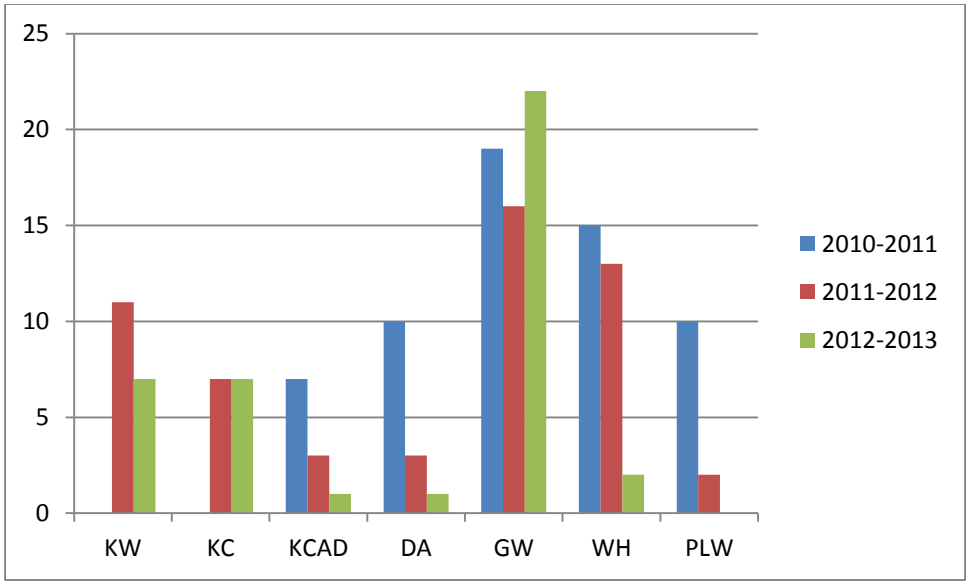


Figure 5: Histogram of the data below concerning the welding studies at Lewis County High School.

Figure 5 depicts the frequency of Lewis County Vocational students completing various requirements within the Welding Department. Unfortunately, every credential decreases in enrollment and successful completion with the exception of Gas Welder. It is also important to note that training of Welder Helper sharply dropped between 2010 and 2012 in Lewis County. The number of Lewis County Vocational students who passed the Kentucky Occupational Skills and Standards Test in Welding significantly dropped between 2011 and 2012.

Table 15: Data set for Lewis county carpentry certifications.

BCF = Basic Carpentry Foundation
RR = Residential Roofer
CRF = Ceiling Roof Framing
CH = Carpentry Helper
FWF = Floor and Wall Framing

Type	2010-2011	2011-2012	2012-2013
BCF	12	16	18
RR	3	8	0
CRF	6	8	0
CH	3	6	0
FWF	9	9	0

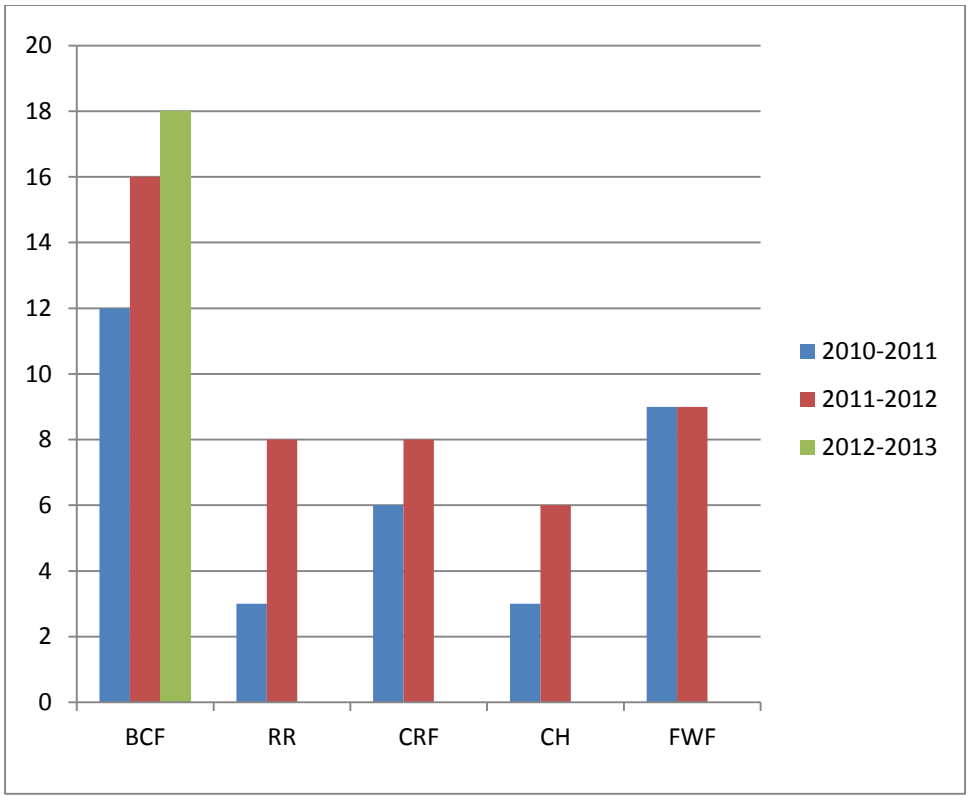


Figure 6: Histogram showing the distribution of carpentry certifications in Lewis County from 2010 to 2013.

Figure 6 depicts that student success in the Carpentry department increased in every certification program between 2010 and 2011. Residential Roofing was the program with the sharpest increase and was followed by Basic Carpentry Foundation. The Carpentry Helper program also made a noticeable jump in the number of students successfully completing the program. It is important to note that while being an impressive feat, the number of students passing the Kentucky Occupational Skills Standards Test in Carpentry remained constant between 2011 and 2012.

Data set for the displaced workers is as follows;

Of the dislocated worker population in this area during 2010, 2011, and 2012:

13% had some supervisory or managerial experience

3% listed carpentry as their primary function

42% had factory/manufacturing experience

1% listed welding as their primary function

4% listed sales as their primary function

3% worked in the health care field

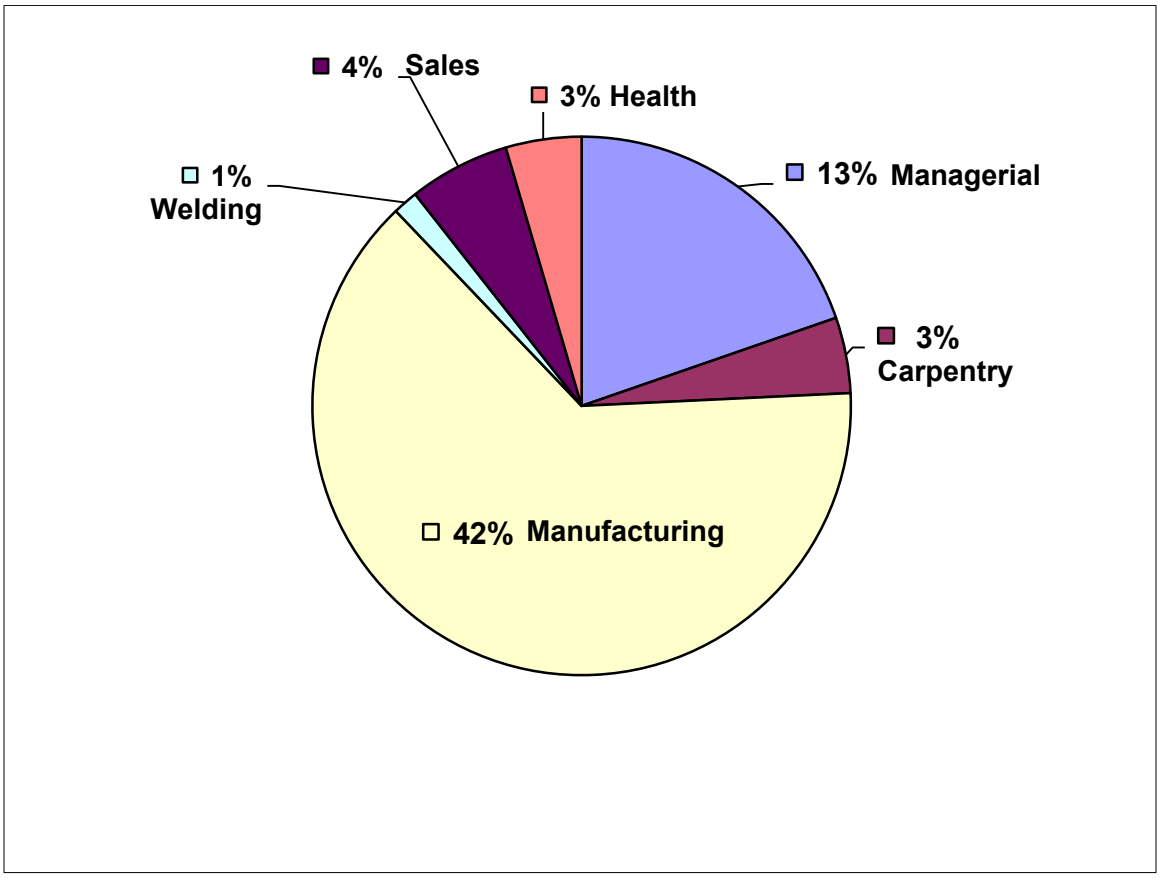


Figure 7**:** Pie graph of the displaced workers and their occupations in the area (Buffalo Trace).

A number of important points can be gleaned from the pie graph in Figure 7 that depicts the distribution of displaced workers in the service region between 2010 and 2012. As expected, there is very little displacement in the medical or health care field. This is a stable market. Secondly, it was not surprising to find that a significant portion of displaced workers had supervisory or managerial experience. Within the most common business model, middle management positions are often the first to be analyzed in corporate financial crisis. The field with the lowest percentage or least displacement was Welding. Conversely, the field with the most displacement was Factory/Manufacturing. Students are graduating from high schools and community colleges with both inadequate education and skills that are not aligned with surrounding job markets and vacancies needed. Four percent of displaced workers responded that their primary field was sales while three percent of those displaced provided that their primary field was carpentry.

Table 16: Data set summary from MCTC.

PROGRAM AND CREDENTIAL EARNED	TOTALS
Automobile/Automotive Mechanics Technology/Technician	**293**
CERT	288
DIPLOMA	5
Carpentry/Carpenter	**347**
CERT	311
DIPLOMA	36
Diesel Mechanics Technology/Technician	**366**
CERT	349
DIPLOMA	17
Electrician	**277**
CERT	249
DIPLOMA	28
Energy Management and Systems Technology/Technician	**68**
AAS	29
CERT	39
Engineering Technology, General	**258**
AAS	21
CERT	226
DIPLOMA	11
Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	**298**
CERT	228
DIPLOMA	70
Industrial Mechanics and Maintenance Technology	**165**
CERT	129
DIPLOMA	36
Machine Shop Technology/Assistant	**136**
AAS	27
CERT	69
DIPLOMA	40
Plastics Engineering Technology/Technician	**1**
CERT	1
Welding Technology/Welder	**817**
CERT	796
DIPLOMA	21
Grand Total	**3026**

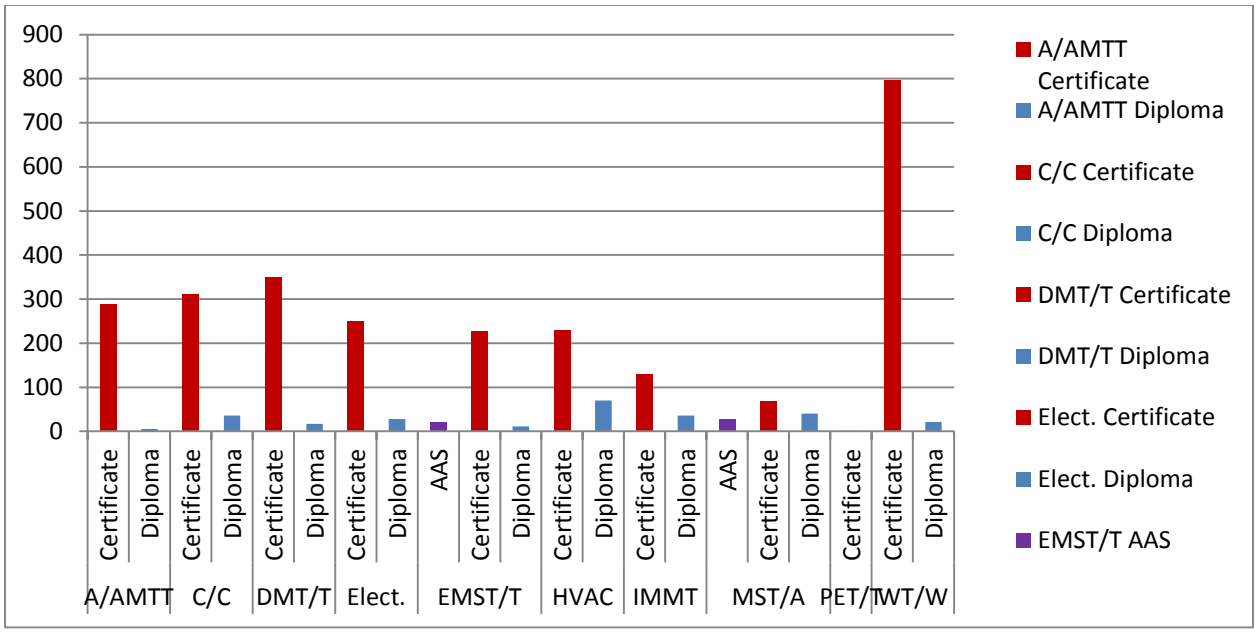


Figure 8: Histogram of MCTC of Program and Credentials Earned

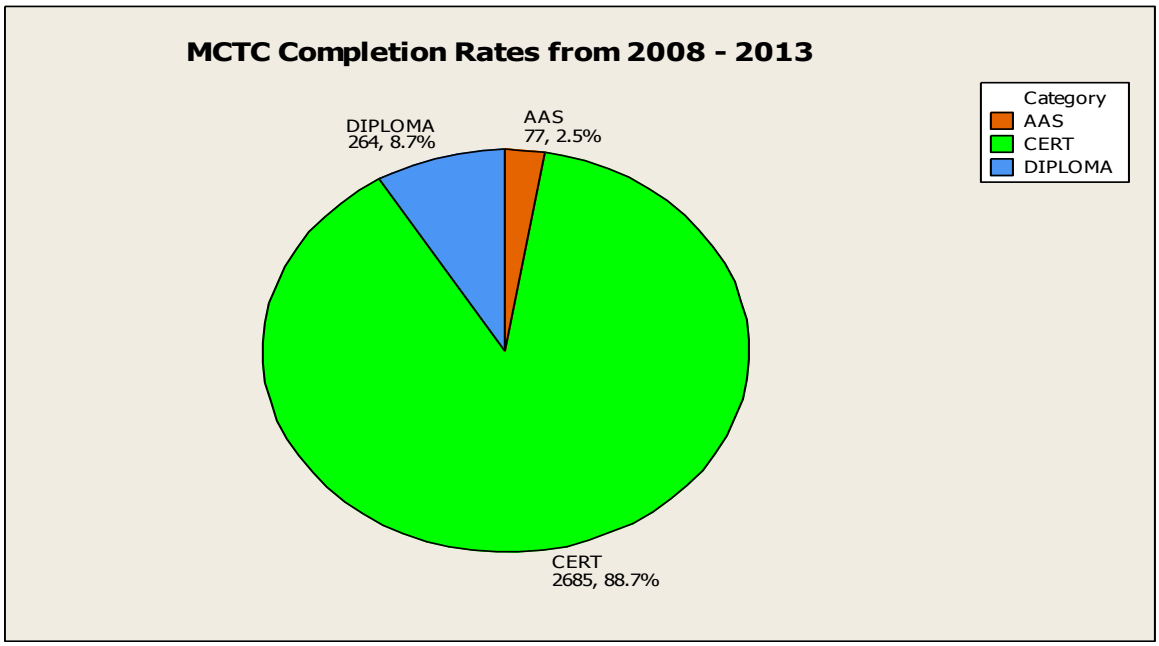


Figure 9: Pie graph of the students that graduate with certifications, diplomas, and Associate Degrees.

The trends in the graph depicting completion rates at Maysville Community and Technical College between 2008 and 2013 are expected. A superficial glance gleans that significantly more M.C.T.C. students completed a certification program than completed a degree program. In fact, nearly three thousand students earned a certificate between 2008 and 2013, but only 77 finished an Associate of Applied Science degree. However, it cannot be discounted that two hundred and sixty four students earned a diploma over the five year period. These credentials become very relevant to the job market of surrounding counties since they form the potential pool from which employers have to choose in hiring and promotion processes.

CHAPTER 5: Findings

From the beginning of the thesis, the focus of the study was to determine the capabilities of the workforce in Lewis County, KY and see if the assumptions of certain business concepts that were developed for a start up company were correct. The capabilties of the students that graduate from the high school have many desirable industrial skill sets for manufacturing that include welding and carpentry. This indicates that these students are good with their hands and can conceptually visualize how machinery and other goods are assembled. If the Lewis County High School Vocational Program could coordinate with MCTC's welding program to enhance a better fundamental understanding of the welding process, then perhaps MCTC could institute a broader focus on robotics welding. Then, once those students achieve the Associate in Applied Science, which MCTC needs more focus on, those students could then attend Morehead State University to gain an education in Robotics, Engineering and Technology Management, or other Industrial Degrees. This would promote growth in the workforce capabilities and complete their potential to build on the foundations that are in place here and now for an immediate impact on the economic potential for the area.

As mentioned, MCTC needs to enhance the graduation rate of the students in the technical programs with Associates in Applied Science. It appears that there are a sufficient number of individuals that are capable of doing multiple manufacturing tasks such as welding, machining, automotive work, and who are capable of earning other industrial certifications, but those students are not graduating with degrees on which they can build. It seems that there is a notion that once the student gains the job skill there is a certain satisfaction level attained and this is not assisting in the area of gaining more people with a Bachelors degree or higher, not to mention that it leaves a limited pool from which to choose when companies are searching for

engineers and other technical or managerial personnel. In order for the region to prosper with job growth, we must have the capabilities in place with leaders that have the ability to manage the personnel and do the engineering because the area has a very hard time recruiting people that will stay. The area, for now, must have the ability to promote from within in order to be successful and sustain growth.

The displaced workforce has an abundance of manufacturing experience and managerial experience, leaving the notion that manufacturing companies that specialize in metal forming and metal removal processes could benefit from this pool. Lewis County High School and Maysville Community and Technical College also do a very good job of supporting this type of industry with the machinist and welding programs available in both institutions making a very convincing argument that Economic Development Commerce Departments should seek companies that conduct these types of manufacturing processes looking to expand or relocate to the area.

Overall, the people of this region are very good with their hands, have good reasoning skills, are loyal to the area, and tend to not want to relocate. This makes them a viable workforce from which many companies could benefit by utilizing the skill set that is already in place to manufacture their products, services, and goods with limited training required for new employees. If we can further educate the skilled labor force we have and give them the engineering and managerial skills to be viable, then economic growth can not only be attained, but it can also occur using the skills that people already have in place.

References Listed

Buffalo Trace Area Development District (2013). Jeremy Faulkner, employee, Maysville, Kentucky.

Burning Glass. (2013). KCTCS Workforce Solutions. Retrieved from http://www.burning-glass.com/

Crouch, Ron. (2013). Kentucky Education & Workforce Development Cabinet. Frankfort, Kentucky.

Department of Labor. (2013). Definition for ONET. Retrieved from http://www.doleta.gov/programs/onet/

Fleming County Chamber of Commerce. (2013). Retrieved from http://www.flemingkychamber.com/industry.asp

Fleming County Schools. (2013). High School Vocational Department. Bobby Pease, welding instructor. Flemingsburg, Kentucky.

Frost, Shelley. (2013). The Importance of Training and Development in the Workplace. Retrieved from http://smallbusiness.chron.com/importance-training-development-workplace-10321.html

Johnson, Sophie. (2013). How to Explain the Importance of Organizational Behaviors. Retrieved from http://smallbusiness.chron.com/explain-importance-organizational-behaviors-26383.html

Jordan, Rick. (2013). Northern Kentucky Industrial Park.

KCTCS Board of Regents Policy 4.12. (2013). Diploma and Certificate. Retrieved from http://legacy.kctcs.edu/employee/policies/volumeI/section4.cfm

Lewis County Chamber of Commerce. (2013). Retrieved from\
http://lewischamber.com/index.php/economic-development

Lewis County Schools. (2013). Spreadsheet of certifications 10-12. Tiffany Felty, Lewis County Schools Central Office. Vanceburg, Kentucky.

Mason County Chamber of Commerce. (2013). From Vicki Steiglder, employee. Maysville, Kentucky.

Mason County Schools. (2013). Vocational Technical Center. Adam Wallingford, welding instructor. Maysville, Kentucky.

Map of Kentucky. (2013). Retrieved from http://en.m.wikipedia.org/wiki/File:Map_of_Kentucky_highlighting_Lewis_County.svg

McGrain and Currens Discussion. (1978). Excerpt and image. Retrieved from http://www.uky.edu/KGS/water/library/gwatlas/Lewis/Topography.htm

Rowan County Chamber of Commerce. (2013). From Jason Sloan, employee. Morehead, Kentucky.

U.S. Census Bureau: State and County Quick-Facts. (2013).

Zaman, Mahmud. (2003). Organizational Behavior Importance. Retrieved from http://zamanfam.com/MBA/OBImportance.html